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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,849	12/09/2003	Christian B. Fuller	38190/270754	4404

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EXAMINER

STONER, KILEY SHAWN

ART UNIT PAPER NUMBER

1725

DATE MAILED: 05/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,849

Applicant(s)

FULLER ET AL.

Examiner

Kiley Stoner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17, 19-21 and 24 is/are rejected.
- 7) ☒ Claim(s) 18 and 22-23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12-9-03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7 and 15-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The length in the longitudinal direction does not structurally limit the first pin portion because it is dependent on the thickness of the first structural member, which is not defined. It is unclear as to what the thickness of the workpiece might be, which in turn makes the claimed length indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

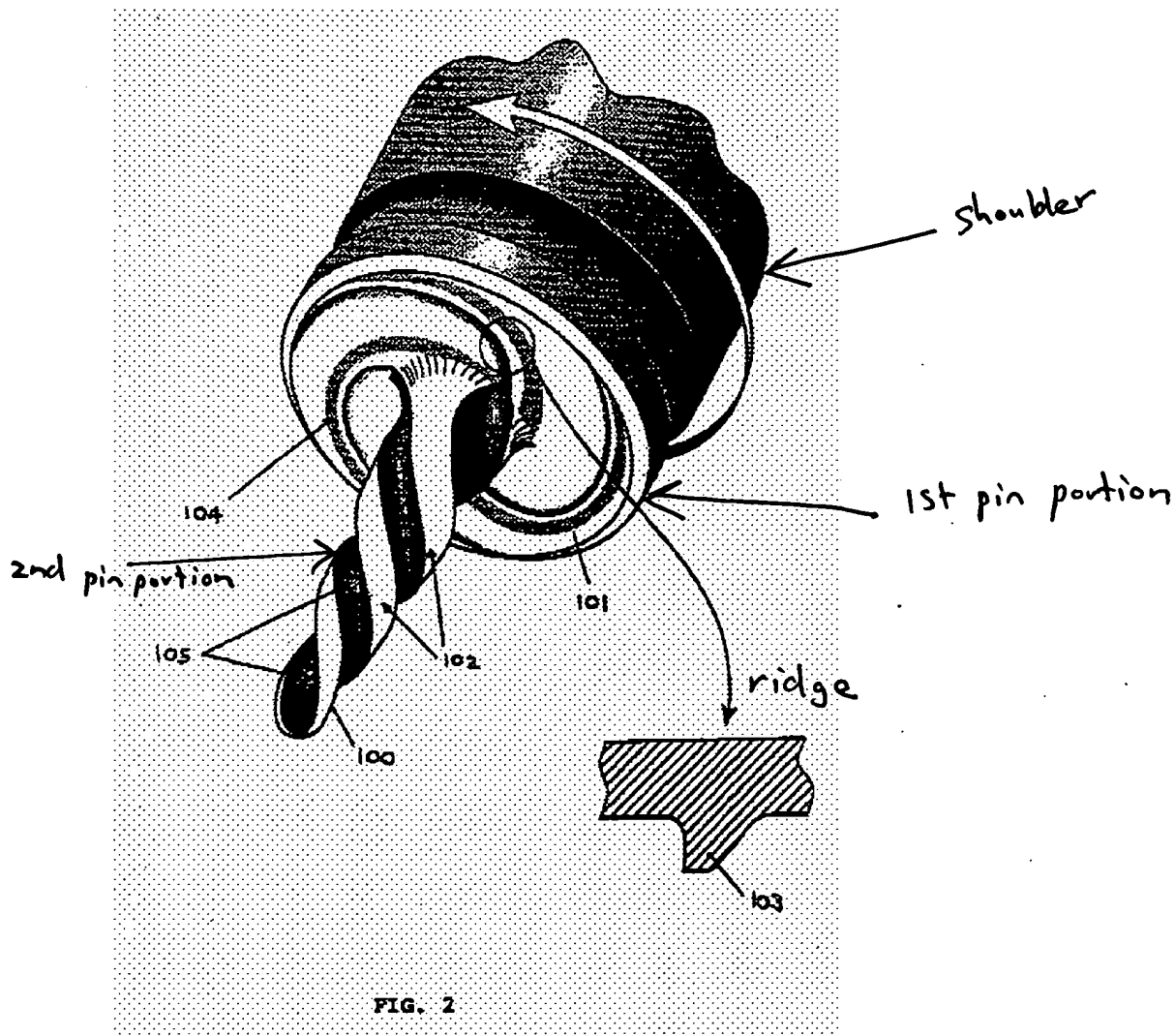
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas et al. (WO 99/52669). Thomas et al. teaches a first pin portion structure to extend longitudinally from a shoulder, the first pin portion defining a contour surface opposite the shoulder; and a second pin portion extending longitudinally from the contour surface

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of the first pin portion, the second portion having a width in a transverse direction that is smaller than a width of the first pin portion, wherein the contour surface of the first pin portion defines at least one ridge extending in a spiral configuration (Figure 2); the ridge of the contour surface extends in a continuous spiral configuration from the second pin portion to an outer diameter of the contour surface (Figure 2); the first pin portion defines a cylindrical outer surface (Figure 2); the second pin portion is tapered in the longitudinal direction away from the contour surface (Figure 2); the second pin portion defines at least one feature extending radially therefrom (Figure 2); the second pin portion defines a generally helical thread extending from an outer surface thereof (Figure 2); the contour surface is generally parallel to the shoulder (Figure 2).

With respect to claim 7, the length in the longitudinal direction does not structurally limit the first pin portion because it is dependent on the thickness of the first structural member.



(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 5-11, 13-17, 19-21 and 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Ezumi et al. (6,783,055 B2). Ezumi et al. teaches a first pin portion structure to extend longitudinally from a shoulder, the first pin portion defining a contour

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surface opposite the shoulder; and a second pin portion extending longitudinally from the contour surface of the first pin portion, the second portion having a width in a transverse direction that is smaller than a width of the first pin portion, wherein the contour surface of the first pin portion defines at least one ridge extending in a spiral configuration (Figures 1-2); the ridge of the contour surface extends in a continuous spiral configuration from the second pin portion to an outer diameter of the contour surface (Figures 1-2); the first pin portion defines a cylindrical outer surface (Figures 1-2); the second pin portion defines at least one feature extending radially therefrom (column 5, lines 53-57); the second pin portion defines a generally helical thread extending from an outer surface thereof (column 5, lines 53-57); the contour surface is generally parallel to the shoulder (Figure 2).

With respect to claim 7 and 15-16, the length in the longitudinal direction does not structurally limit the first pin portion because it is dependent on the thickness of the first structural member.

Ezumi et al. also teaches a rotatable tool having a shoulder, a first pin portion, and a second pin portion, the first pin portion extending longitudinally from the shoulder and having opposite the shoulder a contour surface defining at least one ridge extending in a spiral configuration, the second pin portion extending longitudinally from the contour surface and having a width in a transverse direction that is smaller than a width of the first pin portion; and an actuator connected to the tool and configured to rotate the tool and urge the tool in a longitudinal direction substantially perpendicular to the interface such that the shoulder is urged against the workpiece, the first pin portion extends at

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least partially through the first structural portion, the second pin extends at least partially through the second structural portion, the first and second pin portions thereby plasticizing a portion of the workpiece and forming a friction stir weld lap joint (Figures 1-3 and 11). The apparatus of Ezumi et al. inherently has to have the claimed actuator to perform and complete a friction stir welding process.

Furthermore, Ezumi et al. teaches the ridge of the contour surface extends in a continuous spiral configuration from the second pin portion to an outer diameter of the contour surface (Figures 1-2); the first pin defines a cylindrical outer surface (Figures 1-2); wherein the second pin portion defines at least one feature extending radially therefrom (column 5, lines 53-57); the second pin portion defines a generally helical thread extending from an outer surface thereof (column 5, lines 53-57); the contour surface is generally parallel to the shoulder (column 5, lines 53-57); positioning at least one structural member in an overlapping configuration to define an interface between a first structural portion and a second structural portion; rotating a friction stir welding tool defining a shoulder and a pin extending therefrom; and urging the friction stir welding tool in a longitudinal direction substantially perpendicular to the interface such that the pin extends through the interface with a first portion of the pin extending longitudinally from the shoulder at least partially through the first structural portion to a contour surface of the first pin portion defining at least one ridge extending in a spiral configuration, a second portion of the pin extending longitudinally from a contour surface of the first pin portion at least partially through the second structural portion such that the first and second pin portions thereby plasticize a portion of the workpiece

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and form a friction stir weld joint therein (Figures 1-3 and 11); said rotating and urging steps comprise mixing the plasticized portion of the workpiece with a ridge on the contour surface extending in a continuous spiral configuration from the second pin portion to an outer diameter of the contour surface (Figures 1-3 and 11); said rotating and urging steps comprise mixing the plasticized portion of the workpiece with at least one feature extending radially from the second pin (column 5, lines 53-57 and column 6, line 34-column 7, line 30); the workpieces are aluminum (column 1, lines 6-10).

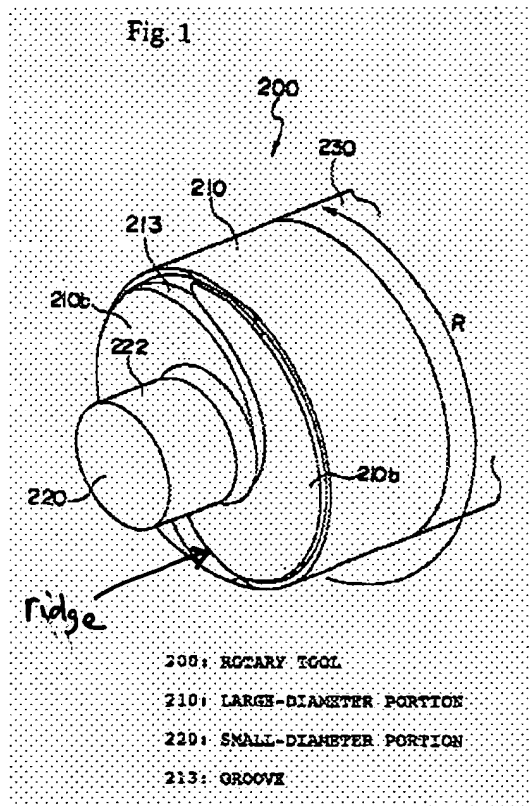
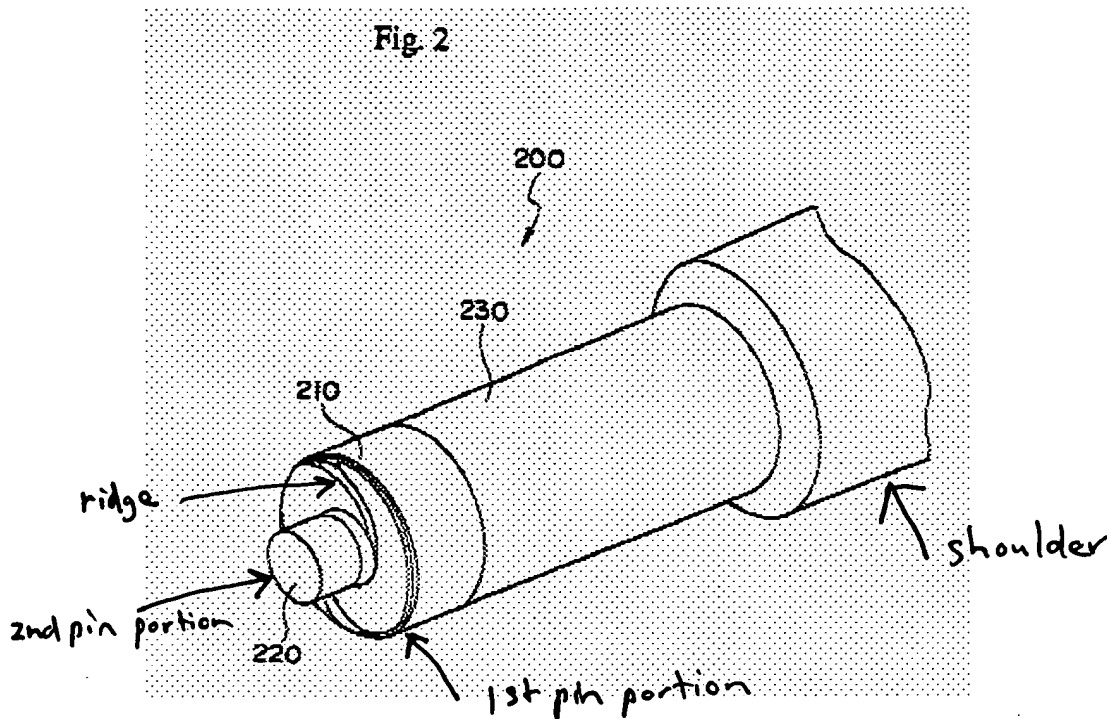


Fig. 2



Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ezumi et al. (6,783,055 B2) as applied to claim 9 above, and further in view of Thomas et al. (WO 99/52669). Ezumi et al. teach all of the limitations of the claims except the second pin portion is tapered in the longitudinal direction away from the contour surface. Thomas et al. teaches the second pin portion is tapered in the longitudinal direction away from

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the contour surface (Figure 2). At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the tapered second pin portion as taught by Thomas et al. with the friction stir welding tool of Ezumi et al. so that the tool can be more easily plunged into the workpiece.

Allowable Subject Matter

Claims 18 and 22-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

The prior art of record that is cited as of interest is presented on the form-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kiley Stoner whose telephone number is (571) 272-1183. The examiner can normally be reached on Monday-Thursday (7:30 a.m. to 6:00 p.m.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on Monday-Friday at (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

KILEY S. STONER
PRIMARY EXAMINER

Kyle Stoner 5/4/05